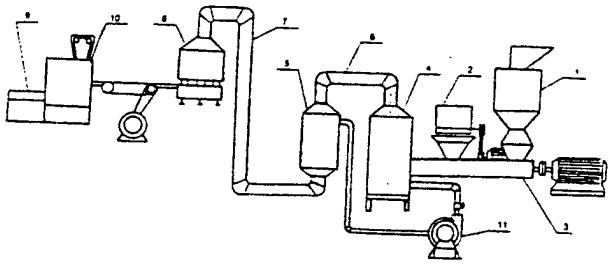
ADVANTAGE - The process uses less sugar and pectin and requires less time as the preparation of gelatine solution takes up to 60-70 minutes (compared to 20-24 hours for pectin solution) and the boiling time is reduced, as the jam has to be boiled only for the time necessary to produce 53-58% solids, compared to 68-73% in the prior art process. The product has reduced calorific value and improved quality. Reduction of boiling time improves the quality of the jam as it reduces the loss of biologically active components, including vitamin C. (3pp Dwg.No.0/0)
C98-035635

★MOKO= D13 98-108765/10 ★RU 2084182-C1
Denitrifying semi-finished potato and root-crops products - involves peeling, cutting into pieces and leaving to stand in aqueous solution of sodium salt of ascorbic acid
MOSC KOLOSS COMBINE 95.02.08 95RU-101923
(97.07.20) A23L 1/212
Denitrifying potato and root crops comprises peeling, cutting into pieces and leaving to stand in hot aqueous 0.1-2% solution of sodium ascorbate in a ratio of pieces of product to medium of 1 : 5 for 10-15 minutes.
ADVANTAGE - The method increases degree of removal of nitrates, increases vitamin C content of product compared to initial vitamin content of potato and root crops, and reduces losses of water-soluble nutritional substances. (4pp Dwg.No.0/0)
C98-035636

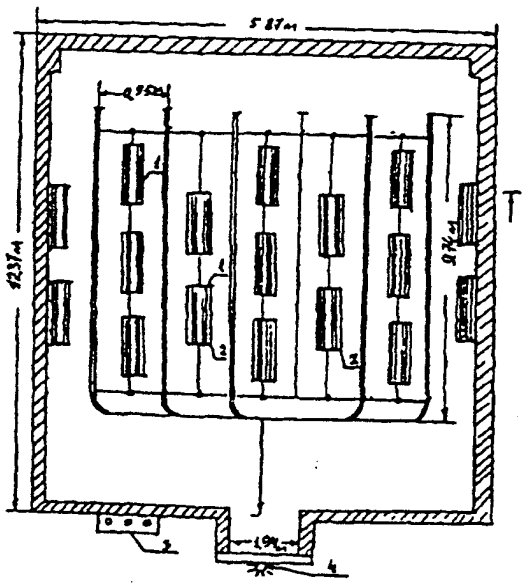
★MOAP= D12 98-108766/10 ★RU 2084184-C1
Obtaining fermented meat product by pickling - in presence of whey previously fermented with Bifidobacterium and Propionibacterium strains
MOSC APPL BIOTECHN ACAD 95.05.18 95RU-108084
(D13) (97.07.20) A23L 1/31, A23B 4/023
A method of obtaining a meat product involves pickling the meat raw material (MRM) in brine containing culinary salt and sugar and whey. The whey is previously fermented with strains of the microorganism Bifidobacterium adolescentis MS-42 (VKPM,N TsMNM V-1987) or Propionibacterium schermanii (VNIMI,N E_6). The MRM is pickled at pH 4.5-5.3 over 70-72 hours, heat treated until ready and cooled.
USE - The method is useful in the meat industry for the production of meat products by fermentation with whey microorganisms, especially Bifidobacterium and Propionibacterium, to give e.g. lactic acid, volatile acids, enzymes, aromatic compounds and vitamins as metabolites.
ADVANTAGES - The method gives improved ecologically safe meat products. (7pp)
C98-035637

★POUL= D12 98-108767/10 ★RU 2084185-C1
Composition for salting meat of water birds - contains salt, ground black pepper and aromatising additive in form of bay leaf and onion, in milled form
POULTRY IND RES INST 93.04.08 93RU-018120
(97.07.20) A23L 1/315
Composition for salting meat from water birds comprises (per 100 kg) salt (1.5-2.5 kg), ground black pepper (0.4-0.6 kg) and aromatising additive containing aromatising additive in form milled bay leaf (0.05-0.1 kg) and milled onion (1.0-4.0 kg).
USE - The method is used to salt the meat of water birds, i.e. geese and ducks.
ADVANTAGE - The composition has the anti-oxidising of provitamin A (carotene), preventing the occurrence of oxidation of fats and thus greatly reducing or even completely eliminating the characteristic odour of the meat. (3pp Dwg.No.0/0)
C98-035638

★KVAR= D12 98-108768/10 ★RU 2084186-C1
Half-finished product obtained from finely comminuted frozen fish. - by coarse and fine comminution, pressing and packaging at low temperature and supplying additives
KVART CO LTD 91.01.11 91SU-4901566
(97.07.20) A23L 1/325
Production of a half-finished product from finely comminuted frozen fish raw material involves coarse and fine comminution of the raw material at -18 to -20degC, feeding air at the same temperature to the comminution zone, pressing the obtained forcemeat and packaging, after fine comminution removes air from the forcemeat. Between the operations of coarse and fine comminution, premixed food additives are introduced into the frozen forcemeat, with subsequent continuous stirring of the forcemeat with additives during the displacement of the product along the processing path. Pressing and packaging of the product are also at -18 to -20degC. Claimed apparatus for the process comprises coarse (1) and fine (4) comminuters for fish, an air feeder (11) for feeding cooled air into the last comminute (4), air separator (5), press (8) and packager (10) which applies film. Th producer has a stirrer and doser (2) for food additives mounted betwee coarse (2) and fine (4) comminuters. Both comminuters (1,4), the stirre and doser (2) of additives and air separator (5) are connected to each othe by transporters (3,6) for the horizontal displacement of product with si multaneous stirring and are disposed in an insulating chamber at an ai temperature of -18 to -20degC.
USE - The method and apparatus may be used on ships and shor installations for producing products from forcemeat.
ADVANTAGE - The method increases product quality, reduces con tamination by 2-2.5 times, improves nutritional and flavour qualities and improves processing reliability. (5pp Dwg.No.1/1)
C98-035639



★VETE= D12 98-108769/10 ★RU 2084189-C1
Sterilisation of animal husbandry raw meat products during defrosting - using ultraviolet radiation at intensity of 8-10 watts per cubic metre and wavelength of 250-260 nm for 1-2 hours at 10-12 hour intervals
VETERINARY SANITATION HYGIENE INST 94.02.28 94RU-006952
P34 (97.07.20) A23L 3/26, A61L 2/10
Sterilisation of animal husbandry products for use during defrosting, using ultraviolet radiation with an intensity of 8-10 W/m^3 and a wavelength of 250-260 nm continuously for 1-2 hours at 10-12 hour intervals.
USE - For the sanitary treatment of raw meat in meat processing plants during defrosting or thawing.
ADVANTAGE - Improves the quality of the finished product due to decontamination of the raw meat full, half or quater carcass during defrosting. The process does not contaminate the environment with chemical disinfectants, and simultaneously sterilises the surfaces of the space of the chamber, instruments, and air reservoir. (4pp Dwg.No.2/2)
C98-035640



(12) Description of an invention re Russian Federation Patent

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(72) I. A. Rogov, N. V. Nefedova, V. A. Aleksakhina, M. B. Sundukova, V. N. Pismenskaya, A. A. Shcherbinin, I. V. Glazkova
(71) to (73) Moscow State Academy of Applied Biotechnology
(76) 1. Seub Jngricl, Martin Michaela, Einfluß der Marinierung mit genußsauren auf Zusammensetzung und Sensorische, Eigenschaften von Rindfleisch, 1991, 71, N 11, pp. 1269 - 1270; 1275 - 1278, 1302. 2. E. N. Kholodova et al. Use of whey in the production of meat dishes. Theses of third report by International Symposium on "Human Ecology: Problems Relating to Composition of Therapeutic and Prophylactic Nutrition", Moscow 1994, page 167. 3. USSR Inventor's Certificate No. 999999, Class A 23 B 4/023, 1983.

(54) A METHOD OF OBTAINING A MEAT PRODUCT

(57) Use: Production of a meat product by controlled fermentation of whey with micro-organisms. The invention basically consists in salting raw meat in whey previously fermented with the micro-organisms Bifidobacterium adolescentis MC-42 (VKPM, N TsMNM V-1987) or Propionibacterium schermanii (VHIMI, N E_6) at pH 4.5 - 5.3 for 70-72 hours, heat-treatment till ready, followed by cooling. 3 tables, 3 drawings.

The invention relates to meat production, particularly to methods of obtaining a meat product by using whey fermented with micro-organisms, more particularly Bifidobacteria and Propionibacteria capable of producing valuable products of metabolism (lactic acid, volatile acids, enzymes, aromatic compounds and vitamins).

There is a known method of treating pieces of beef with solutions of acetic and lactic acid so as to improve the tenderness of the meat. However a high concentration of acids has an adverse effect on the taste of the product [1].

There is a known method of producing therapeutic and prophylactic meat products by using whey [2]. The biological value of whey is due to its content of nitrogenous protein compounds, lactose, vitamins and mineral substances. In order however to obtain an health end-product of high quality, the whey needs constant bacteriological monitoring.

The method nearest technologically to the proposed method is for obtaining a meat product via a liquor containing the meat product together with a composition containing whey, common salt, sugar, acetic acid, sodium nitrite, trisodium pyrophosphate, mustard and other components. However the whey is not previously fermented with lactic-acid micro-organisms, and therefore there is

no accumulation of biologically active substances which widen the range of its biotechnological activity [3].

The object of the invention is to obtain an ecologically harmless meat product with improved functional and technological characteristics.

This is achieved by a method of salting raw meat with a liquor containing edible cooking salt, sugar and whey. According to the invention the whey is first fermented with strains of the micro-organisms Bifidobacterium adolescentis MC-42 (VKPM, N TsMHM V-1987) or Propionibacterium schermanii (VNIMI, N E_6), the liquor being produced with whey at a pH of 4.5 to 5.3.

Whey is needed firstly because of its biological value, due to carbohydrates, protein substances, vitamins, enzymes, micro-elements and organic acids. The carbohydrates, such as lactose, in the whey make it one of the most valuable means for accumulating products of the metabolism of Bifidobacteria and propionic-acid bacteria. Fermentation of the micro-organisms results in organic acids (acetic, propionic), with greater biochemical and anti-bacterial activity than chemically synthesised acetic acid. Also propionic acid bacteria, during their vital activity, produce vitamins in the B_{12} group. Preliminary modification of raw meat with whey and biomass of micro-organisms improves the effect of the enzymatic systems in the gastro-

intestinal tract on nutrients and subsequent acquisition thereof by the organism.

Secondly, whey is available in considerable amounts as a by-product in the production of milk products, and is accessible for use.

The choice of optimum parameters for the process of production using the said micro-organisms, the concentration of microbial biomass and the conditions for biotechnological modification are as follows:

The chosen strain of bifidobacteria for fermenting the whey was Bifidobacterium adolescentis MC-42, used for preparing sour-milk products and capable of producing both lactic and acetic acid. In a nutrient medium containing whey, B.adolescentis accumulates at a rate of 10^8 - 10^9 cells per cm^3. The conditions for effective processing of raw meat (temperature, duration) in fermented whey depend both on a high concentration of bacterial cells per cm^3 and a maximum content of biologically active substances in the whey.

A mixture of whey and water in the proportions 1:1 is taken as the basis for the nutrient medium for cultivating Bifidobacteria. Favourable conditions for accumulating microbial biomass and products of microbial synthesis are obtained by adding a growth stimulator based on hydrolysed milk and corn steep (2 g/dm^3), vitamin C (0.5 g/dm^3) and sodium chloride

(0.5 g/dm^3). Vital activity results in the production of organic acids (acetic and lactic in the proportions 1.5:1.7 to 1) giving a specific taste to the meat product and suppressing putrid microflora in the raw meat. Propagation of the microbial biomass occurs at a temperature of 37°C for 18-24 hours, in a quantity of 10^8 - 10^9 cells per cm of medium.

The medium for propionic acid bacteria includes a mixture of whey and water in the proportions 1:3, a growth stimulator based on hydrolysed milk and corn steep (2 g/dm^3), cobalt chloride (0.003 g/dm^3), and monosubstituted potassium phosphate (4 g/dm^3). The biomass accumulates in 22-26 hours at a temperature of 32°C at the rate of 10^9 - 10^{10} cells per cm^3. In addition to organic acids, the nutrient medium contains vitamin B_{12} (not less than 70 micrograms per dm^3) produced by the micro-organisms and taking an active part in the immunological reactions of the human organism.

Taken together, the biologically active substances formed in the process of cultivation of micro-organisms hasten the development of taste and texture of the finished products. The strain Bifidobacterium adolescentis MC-42 has been deposited in VKPM at VNII genetics (NTsMNM V-1987) and the strain Propionibacterium schermanii N E_6 has been deposited in the collection at the Central Laboratory of Microbiology, VNIMI.

The method of production is as follows. Frozen beef is salted in a liquor containing fermented whey, biomass of micro-organisms, salt and sugar at a pH of 4.5 to 5.3. 10% of the liquor is injected into the thickness of the muscular tissue. After remaining in the liquor for 70 - 72 hours at 6 - 8°C, the meat is cooked in a heat chamber until the temperature at the centre of the product is 72°C (i.e. until ready), and cooled till the temperature is 0 to 6°C throughout the product.

The method of obtaining a meat product is illustrated by the following examples.

Example 1

100 kg of raw material (coxofemoral part) was injected with liquor at pH 4.3 consisting of (in kg): whey fermented with B.adolescentis - 50, salt - 7.5, granulated sugar or glucose - 1.2, in a quantity of 10% of the mass of raw material. The raw material was flooded with liquor in the proportion of 50% by weight and kept in the liquor for 70 - 72 hours at a temperature of 6 - 8°C. Next the raw material, without being washed, was packed in a cellophane wrapper, cooked in a heat chamber until ready (72°C at the centre of the product) and cooled to 0° to 6°C throughout.

Example 2

As in Example 1, but using whey fermented with Pr.schermanii, in liquor at pH 4.5.

Example 3

As in Example 2, but using whey fermented with Pr.schermanii, in liquor at pH 5.3.

Example 4

As in Example 1, except that the substance for processing the raw meat was not whey fermented with micro-organisms but whey at pH 5.3.

As Examples 1, 2 and 3 show, the optimum pH of the liquor is 4.5 to 5.3, and a pH of 4.3 is the limiting value for salting raw meat.

Microstructure investigations (Table 1) confirm that whey fermented with micro-organisms of B.adolescentis or Pr.schermanii for salting raw meat increase the swelling of the muscular fibres, particularly with propionic-acid bacteria, reduce or eliminate transverse striation, and increase transverse micro-fissures and slit-like gaps with partial fragmentation of fibres and outflow of granular protein under the sarcolemma between individual fibres and fascicles as a result of lysis of the fibrillar structure thereof. The connective layers are swollen, with fragmented portions.

Laboratory investigations into the claimed method have shown that the proposed conditions for processing raw meat yield a meat product with good physical and chemical indices and structural mechanical (Table 2) and organoleptic (Table 3) properties.

Consequently, whey fermented with bifidobacteria or propionic acid bacteria can be used to obtain an ecologically safe product with satisfactory functional and technological products and salted for a shorter time.

C L A I M S

A method of obtaining a meat product comprising salting raw meat with a liquor containing edible common salt, sugar and whey, characterised in that the whey is previously fermented with strains of the micro-organisms Bifidobacterium adolescentis MC-42 (VKPM, N TsMNM V - 1987) or Propionibacterium schermanii (VNIMI, N E_6), salting being effected at a pH of 4.5 - 5.3 for 70 - 72 hours followed by heat treatment till ready, and cooling.

Table 1

Salting with whey	Salting with B.adolescentis	Salting with Pr.schermanii
The swelling of muscular fibres is non-uniform, transverse striation is reduced, appears in some parts along the muscular fibres, significant observed quantity of transverse fissures, flaking of sarcolemma and outflow of fine granular material at the fissures and between the fibres. Connective tissue layers are disintegrated with homogeneous portions. The muscular fibres have a mainly polygonal cross-section (Figs. 1a, b).	The muscular fibres are closely adjoining, mainly rectilinear (Fig. 2a, b). Transverse and longitudinal striation are observed. Destructive changes in the form of individual micro-fissures, cracks with fine granular protein material, also under the sarcolemma and between the muscular fibres. Connective tissue layers are homogeneous and slightly undulating and fragmented. Micro-organisms of fermented whey are diffusely scattered. In cross-section the muscular fibres are mainly round.	The muscular fibres are swollen, the boundaries between them are difficult to make out in some regions (Figs. 3a, b). The cores are rounded with pronounced chromatin. Transverse striation is obliterated or not observed. Multiple transverse slit-like ruptures in the integrality of the muscular fibres, outflow of fine granular material at the disintegrated places and under the flaking sarcolemma, to a lesser degree between the fibres. The connective tissue layers are swollen, partly fragmented, the central elements are preserved, diffused micro-organisms of fermented whey are observed. In cross-section the muscular fibres are round, with fine granular protein material and micro-organisms between them (Fig. 3a).

Table 2

Samples	pH	Moisture, content, %	Pressure of microscopic section x 10^{-6}, pA	Cutting work x 10^{-3} J/m^2
Example 1	4.3	71.04	2.14	1.01
Example 2	4.5	70.32	2.19	1.07
Example 3	5.3	70.21	2.31	1.10

Table 3

Indices	External appearance	Colour	Smell	Consis-tency	Juiciness	Taste	Overall evaluation
Product							
Example 2	5.0	4.6	4.7	4.7	4.7	4.8	28.5
Example 3	4.7	4.6	4.6	4.3	4.1	4.3	26.6